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COMMITTEE OF EXPERTS ON THE TRANSPORT
OF DANGEROUS GOODS

Sub-Committee of Experts on the
Transport of Dangerous Goods

# REPORT OF THE SUB-COMMITTEE OF EXPERTS ON ITS SEVENTEENTH SESSION

(Geneva, 6-15 December 1999)

Addendum 2

Annex 2

## Draft amendments to the Model Regulations annexed to the eleventh revised edition of the United Nations Recommendations on the Transport of Dangerous Goods (Refer to ST/SG/AC.10/1/Rev.11)

GE.00- 20053

**DRAFT AMENDMENTS TO THE MODEL REGULATIONS ANNEXED TO THE ELEVENTH REVISED EDITION OF THE UNITED NATIONS RECOMMENDATIONS ON THE TRANSPORT OF DANGEROUS GOODS (Refer to ST/SG/AC.10/Rev.11)**

**Recommendations on the transport of dangerous goods**

Amend paragraph 10 to read:

"Many of the substances listed in Classes 1 to 9 are deemed as being dangerous to the environment. Additional labelling is not always specified except for transport by sea. Criteria for substances dangerous to the aquatic environment are given in Chapter 2.9 of the Model Regulations."

**Chapter 1.2**

1.2.1 Definitions

Change the first sentence in the definition of "Liquids"to read as follows :

*"Liquids* are dangerous goods which at 50 °C have a vapour pressure of not more than 300 kPa (3 bar), which are not completely gaseous at 20 °C and at a pressure of 101.3 kPa, and which have a melting point or initial melting point of 20 °C or less at a pressure of 101.3 kPa."

Amend the definition of "Salvage packagings" to read as follows:

"Salvage packagings are special packagings conforming to the applicable provisions of these Regulations into which damaged, defective, leaking or non-conforming dangerous goods packages, or dangerous goods that have spilled or leaked, are placed for purposes of transport for recovery or disposal".

**Chapter 2.2**

2.2.2.1 Add the following note at the end of the introductory sentence:

*"( **NOTE**: For UN 1950 AEROSOLS, see also the criteria in Special Provision 63 and for UN 2037 RECEPTACLES, SMALL, CONTAINING GAS see also Special Provision 303 )".*

2.2.2.1 (a) Delete the note under this paragraph.

## Chapter 2.9

Add the following section:

**"2.9.2 Classification of substances dangerous to the environment by reason of aquatic pollution**

**2.9.2.1** ***Purpose and applicability***

2.9.2.1 The scheme for classifying substances for the hazards they present to the aquatic environment is intended specifically for use with chemical substances and mixtures, including preparations and waste. While the scheme is intended to apply to all substances, it is recognised that in some cases, e.g. metals or poorly soluble inorganic compounds, special guidance is necessary. See also 2.9.2.8 for explanations on the classification scheme.

***2.9.2.2 Definitions and data requirements***

2.9.2.2.1 The basic elements of the scheme are:

acute aquatic toxicity;
potential for or actual bioaccumulation;
degradation (biotic or abiotic) for organic chemicals; and
chronic aquatic toxicity.

2.9.2.2.2 While data from internationally harmonized test methods are preferred, in practice data from national methods may also be used where they are considered as equivalent. In general, it has been agreed that freshwater and marine species toxicity data can be considered as equivalent data and are preferably to be derived using OECD Test Guidelines or equivalent according to the principles of good laboratory practice (GLP). Where such data are not available, classification shall be based on the best available.

2.9.2.2.3 **Acute aquatic toxicity** shall normally be determined using a fish 96 hour $LC_{50}$ (OECD Test Guideline 203 or equivalent), a crustacean species 48 hour $EC_{50}$ (OECD Test Guideline 202 or equivalent) and/or an algal species 72 or 96 hour $EC_{50}$ (OECD Test Guideline 201 or equivalent). These species are considered as surrogates for all aquatic organisms. Data on other species such as Lemna may also be considered if the test methodology is suitable.

2.9.2.2.4 **The potential for or actual bioaccumulation** shall normally be determined by using the octanol/water partition coefficient, usually reported as a log Kow determined according to OECD Test Guideline 107 or 117. While this represents a potential to bioaccumulate, an experimentally determined Bioconcentration Factor (BCF) provides a better measure and shall be used in preference when available. A BCF shall be determined according to OECD Test Guideline 305.

2.9.2.2.5 **Degradation** for organic chemicals may be biotic or abiotic (eg. hydrolysis) and the criteria used reflect this fact (see 2.9.2.4). Ready biodegradation is most easily defined using the OECD biodegradability tests (OECD Test Guideline 301 (A - F)). A pass level in these tests may be considered as indicative of rapid degradation in most aquatic environments. As these are freshwater tests, use of results from OECD Test Guideline 306, which is more suitable for the marine environment, is also included. Where such data are not available, a BOD(5 days)/COD ratio >0.5 is considered as indicative of rapid degradation. Abiotic degradation such as hydrolysis, primary degradation, both abiotic and biotic, degradation in non-aquatic media and proven rapid degradation in the environment may all be considered in defining rapid degradability.

*[NOTE: Special guidance on data interpretation is provided in the Guidance Document].*

2.9.2.2.6 **Chronic aquatic toxicity** data are less available than acute data and the range of testing procedures less standardised. Data generated according to the OECD Test Guidelines 210 (Fish Early Life Stage), 202 Part 2 or 211 (Daphnia Reproduction) and 201 (Algal Growth Inhibition) may be accepted. Other validated and internationally accepted tests may also be used. The "no observed effect concentrations" (NOECs) or other equivalent L(E)Cx shall be used.

### *2.9.2.3 Classification categories and criteria*

2.9.2.3.1 Substances meeting the following criteria shall be categorised as "dangerous to the aquatic environment" for transport purposes, if they satisfy the criteria for Acute I (and Chronic I by default) or Chronic II. These criteria describe in detail the classification categories set out diagrammatically in 2.9.2.6.

**Acute toxicity**

**Category: Acute I**

Acute toxicity:

| | |
|---|---|
| 96 hr $LC_{50}$ (for fish) | ≤ 1 mg/L and/or |
| 48 hr $EC_{50}$ (for crustacea) | ≤ 1 mg/L and/or |
| 72 or 96hr $ErC_{50}$ (for algae or other aquatic plants) | ≤1 mg/L. |

Category: Acute I may be subdivided for some regulatory systems to include a lower band at $LC_{50}$ or $EC_{50}$ ≤ 0.1 mg/L.

**Chronic toxicity**

**Category: Chronic I**

Acute toxicity:

| | |
|---|---|
| 96 hr $LC_{50}$ (for fish) | ≤ 1 mg/L and/or |
| 48 hr $EC_{50}$ (for crustacea) | ≤ 1 mg/L and/or |
| 72 or 96hr $ErC_{50}$ (for algae or other aquatic plants) | ≤ 1 mg/L |

and the substance is not rapidly degradable and/or the log Kow ≥ 4
(unless the experimentally determined BCF <500).

**Category: Chronic II**

Acute toxicity

| | |
|---|---|
| 96 hr $LC_{50}$ (for fish) | >1 to ≤ 10 mg/L and/or |
| 48 hr $EC_{50}$ (for crustacea) | >1 to ≤ 10 mg/L and/or |
| 72 or 96hr $ErC_{50}$ (for algae or other aquatic plants) | >1 to ≤ 10 mg/L |

and the substance is not rapidly degradable and/or the log Kow ≥4 (unless the experimentally determined BCF <500), unless the chronic toxicity NOECs are > 1 mg/L.

### *2.9.2.4 Rapid degradability*

2.9.2.4.1 Substances are considered rapidly degradable in the aquatic environment if the following criteria are met:

(a) if in 28-day ready biodegradation studies, the following levels of degradation are achieved;

- tests based on dissolved organic carbon: 70%
- tests based on oxygen depletion or carbon dioxide generation: 60% of theoretical maxima.

These levels of biodegradation shall be achieved within 10 days of the start of degradation which point is taken as the time when 10% of the substance has been degraded; or

(b) if, in those cases where only BOD and COD data are available, when the ratio of BOD5/COD is $\geq 0.5$; or

(c) if other convincing scientific evidence is available to demonstrate that the substance can be degraded (biotically and/or abiotically) in the aquatic environment to a level >70% within a 28 day period.

### *2.9.2.5 Classification scheme for substances dangerous in transport to the aquatic environment (abridged OECD Table)*

| Toxicity | | Degradability (note 3) | Bioaccumulation (note 4) | Classification | |
|---|---|---|---|---|---|
| Acute (note 1) | Chronic (note 2) | | | Acute | Chronic |
| Box 1<br><br>value ≤ 1.00<br><br><br>Box 2<br><br>1.0 < value ≤ 10.0 | <br><br><br><br><br><br>Box 7<br><br>value > 1.00 | Box 5<br><br><br><br><br>lack of rapid degradability | Box 6<br><br><br><br><br>BCF ≥ 500 or, if absent log Kow ≥ 4 | <u>Acute I</u><br><br>Box 1 | <u>Chronic I</u><br><br>Boxes 1+5+6<br>Boxes 1+5<br>Boxes 1+6<br><br><u>Chronic II</u><br><br>Boxes 2+5+6<br>Boxes 2+5<br>Boxes 2+6<br>Unless Box 7 |

Notes to the table:

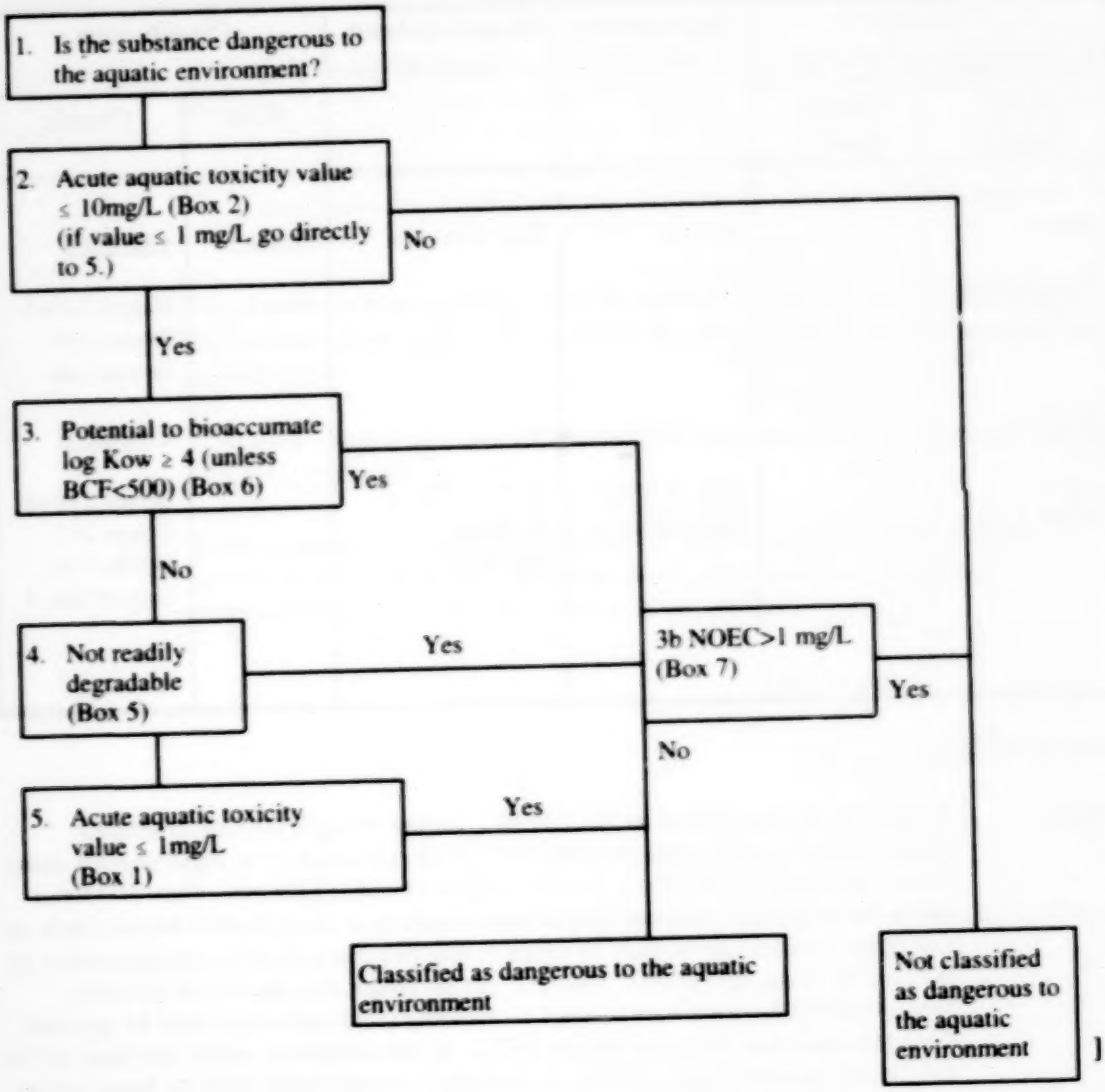
***Note 1:*** *Acute toxicity band based on $LC_{50}$ or $EC_{50}$ values in mg/L for fish, crustacea and/or algae or other aquatic plants (or QSAR estimation if no experimental data). Where the algal toxicity $ErC_{50}$ [ = $EC_{50}$ (growth rate)] falls more than 100 times below the next most sensitive species and results in a classification based solely on this effect, consideration shall be given to whether this toxicity is representative of the toxicity to aquatic plants. Where it can be shown that this is not the case, professional judgement may be used in deciding if classification shall be applied. Classification shall be based on the $ErC_{50}$. In circumstances where the basis of the $EC_{50}$ is not specified and no $ErC_{50}$ is recorded, classification shall be based on the lowest $EC_{50}$ available.*

***Note 2:*** *Chronic toxicity band based on NOEC values in mg/L for fish or crustacea or other recognised measures for long-term toxicity. [It is intended to develop the system further to include chronic toxicity data.]*

***Note 3:*** *Lack of rapid degradability is based on either a lack of ready biodegradability or other evidence of lack of rapid degradation.*

***Note 4:*** *Potential to bioaccumulate, based on an experimentally derived BCF ≥ 500 or, if absent, a log Kow ≥ 4 provided log Kow is an appropriate descriptor for the bioaccumulation potential of the substance. Measured log Kow values take precedence over estimated values and measured BCF values take precedence over log Kow values.*

[*2.9.2.6* ***Procedure for classifiying a substance dangerous to the aquatic environment when transported in packages.***




]

*2.9.2.7* Substances dangerous to the aquatic environment not otherwise classified under these Regulations should be designated:

UN3077 [ENVIRONMENTALLY HAZARDOUS SUBSTANCE] SOLID, N.O.S., or
UN3082 [ENVIRONMENTALLY HAZARDOUS SUBSTANCE] LIQUID, N.O.S.

They shall be assigned to packing group III.

### *2.9.2.8 Explanatory notes on the classification scheme.*

#### *2.9.2.8.1 Basis*

2.9.2.8.1.1 The scheme for classifying substances for the hazards they present to the aquatic environment is based on *[the globally harmonised system]*. The aquatic environment may be considered in terms of the aquatic organisms that live in the water, and the aquatic ecosystem of which they are part. *[This does not address aquatic pollutants for which there may be a need to consider effects beyond the aquatic environment such as the impacts on human health etc.]*. The basis, therefore, of the identification of hazard is the aquatic toxicity of the substance, although this may be modified by taking account of the degradation and bioaccumulation behaviour.

2.9.2.8.1.2 This scheme is intended specifically for use with chemical substances *[and will be extended at a later stage to cover preparations or other mixtures such as formulated pesticides]*. While the scheme is intended to apply to all substances, it is recognised that in some cases, e.g. metals or poorly soluble inorganic compounds, special guidance will be necessary. *[The Guidance Document prepared [under the globally harmonised system] covers issues such as data interpretation and the application of the criteria defined below to such substances. Considering the complexity of this endpoint and the breadth of the application of the scheme, the Guidance Document is an important element in the operation of the [harmonised] system]*.

#### *2.9.2.8.2 Rationale for the scheme*

2.9.2.8.2.1 The classification scheme recognises that the core intrinsic hazard to aquatic organisms is represented by both the acute and chronic toxicity of a substance. Distinction is made between the acute hazard and the chronic hazard and therefore separate hazard categories are defined for both properties representing a gradation in the level of hazard identified. The lowest of the available toxicity values shall be used to define the appropriate hazard category(s). There may be circumstances, however, when a weight of evidence approach may be used. Acute toxicity data are the most readily available and the tests used are the most standardised. For that reason, these data form the core of the classification scheme.

2.9.2.8.2.2 Acute toxicity represents a key property in defining the hazard where transport of large quantities of a substance may give rise to short-term dangers arising from accidents or major spillages. Hazards categories up to $LC_{50}$ or $EC_{50}$ values of 10 mg/L are thus defined, although categories up to 1000 mg/L may be used in certain regulatory frameworks. *[The Acute category 1 may be further sub-divided to include an additional category for acute toxicity $LC_{50}$ or $EC_{50} \leq 0.1$ mg/L in certain regulatory systems such as that defined by MARPOL 73/78 Annex II concerning bulk transport by sea]*.

2.9.2.8.2.3 For packaged substances it is considered that the principal hazard is defined by chronic toxicity, although acute toxicity at $LC_{50}$ or $EC_{50}$ levels $\leq$ 1 mg/L is also considered hazardous. Levels of substances up to 1 mg/L are considered to be possible in the aquatic environment following normal use and disposal. At toxicity levels above this, the short-term toxicity itself does not describe the principal hazard, which arises from low concentrations causing effects over a longer time scale. Thus, a number of hazard categories are defined which are based on levels of chronic aquatic toxicity. Chronic toxicity data are not available for many substances and it is necessary to use the available data on acute toxicity to estimate this property.
The intrinsic properties of a lack of rapid degradability and/or a potential to bioconcentrate in combination with acute toxicity may be used to assign a substance to a chronic hazard category.

Chronic toxicity showing NOECs >1 mg/L indicates that there is no chronic hazard category classification.

2.9.2.8.2.4 While the current scheme uses acute toxicity data in combination with a lack of rapid degradation and/or a potential to bioaccumulate as the basis for classification for assigning a chronic hazard category, actual chronic toxicity data form a better basis for classification where these data are available. *[It is thus the intention that the scheme should be further developed to accommodate such data. It is anticipated that in such a further development, the available chronic toxicity data would be used to classify in the chronic hazard in preference to that derived from their acute toxicity in combination with a lack of rapid degradation and/or a potential to bioaccumulate].*

*[2.9.2.8.2.5 Recognition is given to the classification goals of MARPOL 73/78 Annex II that covers the transport of bulk quantities in ships' tanks, which are aimed at regulating operational discharges from ships and the assigning of suitable ship types. They go beyond protecting aquatic ecosystems, although that clearly is included. Additional hazard categories may thus be used which take account of factors such as physico-chemical properties and mammalian toxicity.]*

**2.9.2.8.3 *[Explanatory notes]***

2.9.2.8.3.1 The organisms fish, crustacea and algae are tested as surrogate species covering a range of trophic levels and taxa, and the test methods are highly standardised. Data on other organisms may also be considered, provided they represent equivalent species and test endpoints. The algal growth inhibition test is a chronic test, but the $EC_{50}$ is treated as an acute value for classification purposes. This $EC_{50}$ is normally based on growth rate inhibition. If only the $EC_{50}$ based on reduction in biomass is available, or it is not indicated which $EC_{50}$ is reported, this value may be used in the same way.

2.9.2.8.3.2 Aquatic toxicity testing by its nature involves the dissolution of the substance under test in the water media used and the maintenance of a stable bioavailable exposure concentration over the course of the test. Some substances are difficult to test under standard procedures and *[special guidance will be developed on data interpretation for these substances and how the data should be used when applying the classification criteria].*

2.9.2.8.3.3 It is the bioaccumulation of substances within the aquatic organisms that can give rise to toxic effects over longer time scales even when actual water concentrations are low. The potential to bioaccumulate is determined by the partitioning between n-octanol and water. The relationship between the partition coefficient of an organic substance and its bioconcentration as measured by the BCF in fish has considerable scientific literature support. Using a cut-off value of log Kow (log P(o/w)) ≥4 is intended to identify only those substances with a real potential to bioconcentrate. In recognition that the log Kow is only an imperfect surrogate for a measured BCF, such a measured value shall always take precedence. A BCF in fish of <500 indicates a low level of bioconcentration.

2.9.2.8.3.4 Substances that rapidly degrade can be quickly removed from the environment. While effects can occur, particularly in the event of a spillage or accident, they will be localised and of short duration. The absence of rapid degradation in the environment can mean that a substance in the water has the potential to exert toxicity over a long period and a wide area. One way of demonstrating rapid degradation utilises the biodegradation screening tests designed to determine whether a substance is "readily biodegradable". Thus a substance which passes this

screening test is one that is likely to biodegrade "rapidly" in the aquatic environment, and is thus unlikely to be persistent. However, a failure in the screening test does not necessarily mean that the substance will not degrade rapidly in the environment. Thus a further criterion allows the use of data to show that the substance did actually degrade biotically or abiotically in the aquatic environment by >70% in 28 days. Thus, if degradation is demonstrated under environmentally realistic conditions, then the definition of "rapid degradability" is met. Many degradation data are available in the form of degradation half-lives and these may also be used in defining rapid degradation. *[Details regarding the interpretation of these data are further elaborated in the Guidance Document]*. Some tests measure the ultimate biodegradation of the substance, i.e. full mineralisation is achieved. Primary biodegradation shall not normally qualify in the assessment of rapid degradability unless it can be demonstrated that the degradation products do not fulfil the criteria for classification as dangerous to the aquatic environment.

2.9.2.8.3.5 The criteria used reflect the fact that environmental degradation may be biotic or abiotic (e.g. hydrolysis). Equally, failing the ready biodegradability criteria in the OECD tests does not mean that the substance will not be degraded rapidly in the real environment. Thus, where such rapid degradation can be shown, the substance shall be considered as rapidly degradable. Hydrolysis may be considered if the hydrolysis products do not fulfil the criteria for classification as dangerous to the aquatic environment. A specific definition of rapid degradability is included at 2.9.2.4. Other evidence of rapid degradation in the aquatic environment may also be considered and may be of particular importance where the substances inhibit microbial activity at the concentration levels used in standard testing. *[The range of available data and guidance on its interpretation are provided in the Guidance Document]*.

2.9.2.8.3.6 For inorganic compounds and metals, the concept of degradability as applied to organic compounds has limited or no meaning. Rather the substance may be transformed by normal environmental processes either to increase or to decrease the bioavailability of the toxic species. Equally the use of bioaccumulation data shall be treated with care. *[Specific guidance will be provided on how these data for such substances may be used in meeting classification criteria requirements]*.

2.9.2.8.3.7 Poorly soluble inorganic compounds and metals may be acutely or chronically toxic in the aquatic environment depending on the intrinsic toxicity of the bioavailable inorganic species and the rate and amount of this species which may enter solution. *[A protocol for testing these poorly soluble substances is being developed and will be covered further in the Guidance Document]*.

2.9.2.8.3.8 While experimentally derived test data are preferred, where no experimental data are available, validated Quantitative Structure Activity Relationships (QSARs) for aquatic toxicity and log Kow may be used in the classification process. Such validated QSARs may be used without modification to the agreed criteria, if restricted to chemicals for which their mode of action and applicability are well characterized. *[Validity may be judged according to the criteria established within the US-EPA/EU/Japan Collaborative Project]. [Reliable calculated toxicity and log Kow values shall be valuable in a safety net context.] [QSARs for predicting ready biodegradation are not yet sufficiently accurate to predict rapid degradation]*.

**2.9.2.8.4 Classification scheme for substances hazardous to the aquatic environment**

| Toxicity | | Degradability (note 3) | Bioaccumulation (note 4) | Classification categories | |
|---|---|---|---|---|---|
| Acute (note 1) | Chronic (note 2) | | | Acute | Chronic |
| Box 1<br>value ≤ 1.00 | | Box 5 | Box 6 | Class: Acute I<br>Box 1 | Class: Chronic I<br>Boxes 1+5+6<br>Boxes 1+5<br>Boxes 1+6 |
| Box 2<br>1.00< value ≤ 10.0 | | Lack of rapid degradability | BCF ≥ 500 or, if absent log Kow ≥4 | Class: Acute II<br>Box 2 | Class: Chronic II<br>Boxes 2+5+6<br>Boxes 2+5<br>Boxes 2+6<br>Unless Box 7 |
| Box 3<br>10.0< value ≤100 | | | | Class: Acute III<br>Box 3 | Class: Chronic III<br>Boxes 3+5+6<br>Boxes 3+5<br>Boxes 3+6<br>Unless Box 7 |
| Box 4<br>No acute toxicity (note 5) | Box 7<br>value>1.00 | | | | Class: Chronic IV<br>Boxes 4+5+6<br>Unless Box 7 |

**Notes to the table:**

***Note 1a.*** *Acute toxicity band based on L(E)C-50 values in mg/L for fish, crustacea and/or algae or other aquatic plants (or QSAR estimation if no experimental data).*

***Note 1b.*** *Where the algal toxicity ErC-50 [ = EC-50 (growth rate)] falls more than 100 times below the next most sensitive species and results in a classification based solely on this effect, consideration should be given to whether this toxicity is representative of the toxicity to aquatic plants. Where it can be shown that this is not the case, professional judgement should be used in deciding if classification should be applied. Classification should be based on the ErC-50. In circumstances where the basis of the EC-50 is not specified and no ErC-50 is recorded, classification should be based on the lowest EC-50 available.*

***Note 2a.*** *Chronic toxicity band based on NOEC values in mg/L for fish or crustacea or other recognised measures for long-term toxicity.*

***Note 2b.*** *It is the intention that the system be further developed to include chronic toxicity data.*

***Note 3.*** *Lack of rapid degradability is based on either a lack of Ready Biodegradability or other evidence of lack of rapid degradation.*

***Note 4.*** *Potential to bioaccumulate, based on an experimentally derived BCF ≥ 500 or, if absent, a log Kow ≥ 4 provided log Kow is an appropriate descriptor for the bioaccumulation potential of the substance. Measured log Kow values take precedence over estimated values and measured BCF values take precedence over log Kow values.*

***Note 5.*** *"No acute toxicity" is taken to mean that the L(E)C-50 is above the water solubility. Also for poorly soluble substances, (w.s. < 1.00 mg/L), where there is evidence that the acute test would not have provided a true measure of the intrinsic toxicity.*

## Chapter 3.1

3.1.2.6 Add the following text at the end of the new paragraph 3.1.2.6

"When temperature control is used to stabilize such substances to prevent the development of any dangerous excess pressure then:

- for liquids where the SADT is less than 50 °C, the provisions of 7.1.4 shall apply;
- for gases, the conditions of transport shall be approved by the competent authority."

## Chapter 3.2

## DANGEROUS GOODS LIST

UN 1133 Replace "NONE" with "500 ml" in column (7) for PG I.

Replace "1 L" with "5 L" in column (7) for PG II.

UN 1139 Replace "NONE" with "500 ml" in column (7) for PG I.

Replace "1 L" with "5 L" in column (7) for PG II.

UN 1169 Replace "1 L" with "5 L" in column (7) for PG II.

UN 1197 Replace "1 L" with "5 L" in column (7) for PG II.

UN 1210 Replace "NONE" with "500 ml" in column (7) for PG I.

Replace "1 L" with "5 L" in column (7) for PG II.

UN 1263 Replace "NONE" with "500 ml" in column (7) for PG I.

Replace "1 L" with "5 L" in column (7) for PG II.

UN 1266 Replace "1 L" with "5 L" in column (7) for PG II.

UN 1267 Replace "NONE" with "500 ml" in column (7) for PG I.

UN 1268 Replace "NONE" with "500 ml" in column (7) for PG I.

UN 1287 Replace "1 L" with "5 L" in column (7) for PG II.

UN 1306 Replace "1 L" with "5 L" in column (7) for PG II.

UN 1841 Replace "NONE" with "5 kg" in column (7).

UN 1863 Replace "NONE" with "500 ml" in column (7) for PG I.

UN 1866 Replace "NONE" with "500 ml" in column (7) for PG I.

Replace "1 L" with "5 L" in column (7) for PG II.

UN 1999 Replace "1 L" with "5 L" in column (7) for PG II.

UN 2030 Amend the name in column (2) to read as follows:

"HYDRAZINE AQUEOUS SOLUTION, with not less than 37% hydrazine, by mass".

UN 2037 Remove Special Provision 63 from the entry RECEPTACLES, SMALL CONTAINING GAS, and replace it by special provision 303.

UN 2212 Replace "NONE" with "1 kg" in column (7).

UN 2315 Insert "1 L " in column (7).

UN 2672 AMMONIA SOLUTION: Add new special provision B11 in column (9).

UN 2969 Replace "NONE" with "5 kg" in column (7).

UN 3065 Replace "1 L" with "5 L" in column (7) for Class 3 and PG II.

UN 3151 Replace "NONE" with "1 L " in column (7).

UN 3152 Replace "NONE" with "1 kg" in column (7).

UN 3269 Replace "1 L" with "5 L" in column (7) for PG II.

UN 3295 Replace "NONE" with "500 ml" in column (7) for and PG I.

UN 3359 Insert special provision "302" in column (6).

Amend */ the name in column (2) to read as follows :

"FUMIGATED UNIT"

Limited Quantities, Column 7. The following limits have been adopted:

- Class 3, PG II: General limit 1 *l* except for Un numbers: 1133, 1139, 1169, 1197, 1210, 1263, 1266, 1287, 1306, 1866, 1999, 3065, 3269 (5 L, see above)
- Division 4.1, PG II, substances currently authorized to be transported as limited quantities: 1 kg.
- Division 4.1, PG III, substances currently authorized to be transported as limited quantities: 5 kg.
- Division 5.1, PG II: 1 L (for liquids); 1 kg (for solids).

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*/ *Not applicable to the French text.*

- Division 5.1, PG III: 5 L (for liquids); 5 kg (for solids).
- Division 6.1, PG III: 5 L (for liquids); 5 kg (for solids).
- Class 8, PG II: 1 L (for liquids); 1 kg (for solids).
- Class 8, PG III: 5 L (for liquids); 5 kg (for solids).
- Class 9, PG III: 5 L (for liquids); 5 kg (for solids).

## Chapter 3.3
## Special provisions

Section 3.3.1

Special provisions

SP 63 Amend to read as follows:

"63 The division of Class 2 and the subsidiary risks depend on the nature of the contents of the aerosol. The following provisions shall apply:

Division 2.1 applies if the contents include more than 45% by mass, or more than 250g of flammable components. Flammable components are gases which are flammable in air at normal pressure or substances or preparations in liquid form which have a flash point less than or equal to 100 °C.

Division 2.2 applies when the contents do not meet the above criteria for division 2.1.

Gases of Division 2.3 shall not be used as a propellant in an aerosol.

Where the contents other than the propellant of aerosols to be ejected are classified as Division 6.1 packing groups II and III or Class 8 packing groups II and III, the aerosol shall have a subsidiary risk of Division 6.1 or Class 8.

Aerosols with contents meeting the criteria for packing group I for toxicity or corrosivity shall be prohibited from carriage.

Subsidiary hazard labels may be required for air transport".

SP 179 Amend special provision 179 to read:

"179 This designation shall be used for substances which are dangerous to the aquatic environment or which are marine pollutants that do not meet the classification criteria of any other class or another substance within Class 9. This designation may also be used for wastes not otherwise subject to these Regulations but which are covered under the Basel Convention on the control of Transboundary Movements of Hazardous wastes and their Disposal."

SP 216 Add the following text:

"216 Sealed packets containing less than 10 ml of a packing group II or III flammable liquid absorbed into a solid material are not subject to these Regulations provided there is no free liquid in the packet."

SP 251 Add the following text:

"251 Chemical kits and first aid kits containing dangerous goods in inner packagings which do not exceed the quantity limits applicable to individual substances as specified in column (7) of the Dangerous Goods List may be transported in accordance with Chapter 3.4."

SP 302 Add the following new special provision:

"302 In the proper shipping name, the word UNIT means:

a road freight vehicle;
a railway freight wagon;
a freight container;
a road tank vehicle;
a railway tank wagon; or
a portable tank."

SP 303 Add a new Special Provision assigned to UN 2037 as follows:

"303 The classification of UN 2037 shall be based on the gases contained therein and in accordance with the provisions of Chapter 2."

## Chapter 3.4

3.4.8 Insert the following paragraph and renumber existing 3.4.8 accordingly "3.4.9":

"3.4.8 Packages containing dangerous goods in limited quantities need not be marked with the proper shipping name of the contents, but shall be marked with the UN number of the contents (preceded by the letters "UN") placed within a diamond. The width of line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. Where more than one substance assigned to different UN numbers are included in the package, the diamond shall be large enough to include each relevant UN number."

## Chapter 4.1

4.1.1.15.1 Amend to read as follows:

"4.1.1.15.1 Damaged, defective, leaking or non-conforming packages, or dangerous goods that have spilled or leaked may be transported in salvage packagings

mentioned in 6.1.5.1.11. This does not prevent the use of a bigger size packaging of appropriate type and performance level under the conditions of 4.1.1.15.2."

4.1.3.4 Amend the text of paragraph 4.1.3.4 concerning IBCs to read as follows:

"IBCs

For substances of packing group I:

All types of IBCs

For substances of packing groups II and III:

| | |
|---|---|
| Wooden: | 11C, 11D and 11F |
| Fibreboard: | 11G |
| Flexible: | 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2 |
| Composite: | 11HZ2, 21HZ2 and 31HZ2" |

4.1.3.8 Add a new section 4.1.3.8 as follows:

"4.1.3.8 Unpackaged articles other than Class 1

4.1.3.8.1 Where large and robust articles cannot be packaged in accordance with the provisions of Chapters 6.1 or 6.6 and they have to be transported empty, uncleaned and unpackaged the competent authority may approve such transport. In doing so the competent authority shall take into account that:

(a) Large and robust articles shall be strong enough to withstand the shocks and loadings normally encountered during transport including trans-shipment between transport units and/or warehouses, as well as any removal from a pallet for subsequent manual or mechanical handling;

(b) All closures and apertures shall be sealed such that there can be no loss of contents which might be caused under normal conditions of transport, by vibration, or by changes in temperature, humidity or pressure (resulting from altitude, for example). No dangerous residue shall adhere to the outside of the large and robust articles;

(c) Parts of large and robust articles, which are in direct contact with dangerous goods:

(i) shall not be affected or significantly weakened by those dangerous goods; and

(ii) shall not cause a dangerous effect e.g. catalysing a reaction or reacting with the dangerous goods;

(d) Large and robust articles containing liquids shall be stowed and secured to ensure that neither leakage nor permanent distortion of the article occurs during transport;

(e) They shall be fixed in cradles or crates or other handling devices in such a way that they will not become loose during normal conditions of transport.

4.1.3.8.2 Unpackaged articles approved by the competent authority in accordance with the provisions of 4.1.10.1 shall be subject to the consignment procedures of Part 5. In addition the consignor of such articles shall ensure that a copy of any such approval is carried with the large and robust articles.

***Note:*** *A large and robust article may include flexible fuel containment systems, military equipment, machinery or equipment containing dangerous goods above the limited quantity thresholds.*"

4.1.4.1 Packing Instruction P002, Special packing provision 11:

Replace "or" with "and" after "plastics bags".

4.1.4.2 IBC03: Add new special provision B11 to read as follows:

"B11: UN 2672 Ammonia solution in concentrations up to 25% may be transported in rigid or composite plastics IBCs (31H1, 31H2 and 31HZ1)".

## Chapter 5.2

5.2.2.2.1.6 Add the following paragraph:

"(c) The division 2.1. label displayed on cylinders and gas cartridges for liquid petroleum gases, where they may be shown in the background colour of the receptacle if adequate contrast is provided."

5.2.2.2.2 Amend 5.2.2.2.2 to read as follows:

"(No 2.1)
Division 2.1
Flammable gases
Symbol (flame): black or white (except as provided for in 5.2.2.1.6 (c))
Background: red, Figure "2" in bottom corner".

## Chapter 5.5

5.5.2, 5.5.2.1 and 5.5.2.2 Delete the word "transport" before unit (not applicable to the French text).

## Chapter 6.5

6.5.1.2 Definitions:

*Maximum permissible load:* Delete.

*Maximum permissible gross mass* :Amend the definition to avoid the term "load" to read:

*"Maximum permissible gross mass* means the mass of the IBC and any service or structural equipment together with the maximum net mass."

6.5.1.4.1 (a) Amend the top line centre column in the table to read "For solids, filled or discharged".

6.5.1.4.3 Change "loaded" to "filled" in the table 18 times.

6.5.2.1.1 (h) Delete "..... or, for flexible IBCs the maximum permissible load, in kg." so that it reads "The maximum permissible gross mass in kg."

6.5.2.2.1 Change "Maximum loading/discharge pressure" to "Maximum filling/discharge pressure".

6.5.3.1.1 Change "loaded" to "filled" twice.

6.5.3.3.1 Change "loaded" to "filled" 4 times.

6.5.3.4.1 Change "loaded" to "filled" 4 times.

6.5.3.5.1 Change "loaded" to "filled".

6.5.3.6.1 Change "loaded" to "filled".

6.5.4.4.2 Reword 6.5.4.4.2 in the bottom lift test as follows:

"The IBC shall be filled. A load shall be added and evenly distributed. The mass of the filled IBC and the load shall be 1.25 times the maximum permissible gross mass."

6.5.4.5.2 Reword the first sentence of this paragraph in the top lift test as follows:

"Metal, rigid plastics and composite IBCs shall be filled. A load shall be added and evenly distributed. The mass of the filled IBC and the load shall be twice the maximum permissible gross mass."

6.5.4.6.2 Reword 6.5.4.6.2 in the stacking test to read as follows:

"The IBC shall be filled to its maximum permissible gross mass. If the specific gravity of the product being used for testing makes this impracticable, the IBC shall additionally be loaded so that it is tested at its maximum permissible gross mass the load being evenly distributed."

6.5.4.6.3 Reword 6.5.4.6.3(b) (i) to read:

"one or more IBCs of the same type filled to the maximum permissible gross mass stacked on the test IBC" [Rest of sentence deleted].

6.5.4.7.1 Change "loaded" to "filled".

6.5.4.8.1 Change "loaded" to "filled".

6.5.4.9.2 (b) Amend to read:

"(b) Flexible IBCs: the IBC shall be filled to not less than 95% of its capacity and to its maximum permissible gross mass, the contents being evenly distributed."

6.5.4.10.2, 6.5.4.11.2
and 6.5.4.12.2. Amend this paragraphs to read as follows:

"The IBC shall be filled to not less than 95% of its capacity and to its maximum permissible gross mass, the contents being evenly distributed."

6.5.4.10.3 Amend the second sentence of 6.5.4.10.3 to read "The IBC shall then be subjected to a uniformly distributed superimposed load equivalent to twice the maximum permissible gross mass."

6.5.4.14.3 Change "loaded" to "filled".

6.5.4.4.2, 6.5.4.5.2, 6.5.4.6.2,
6.5.4.7.2, 6.5.4.8.2, 6.5.4.9.2,
6.5.4.10.2, 6.5.4.11.2 and 6.5.4.12.2 : Amend the heading of this paragraphs "Preparation of the IBCs for test" to read as follows:

"Preparation of the IBC for test".

## Chapter 6.6

6.6.5.3.3.4 Amend "must" to "may".

6.6.5.3.1.2 )
6.6.5.3.1.3 )
6.6.5.3.1.4 )
6.6.5.3.2.2 )
6.6.5.3.2.3 )
6.6.5.3.3.2 )
6.6.5.3.3.3 ) Amend the word "packagings" to "packaging".
6.6.5.3.3.4 )
6.6.5.3.3.5 )
6.6.5.3.4.2 )
6.6.5.3.4.3 )
6.6.5.3.4.5.1 )
6.6.5.3.4.5.3 )

6.6.5.3.2.2 Replace the existing paragraph with the following text:

"6.6.5.3.2.2 Preparation of large packagings for test

The large packaging shall be loaded to twice its maximum permissible gross mass. A flexible large packaging shall be loaded to six times its maximum permissible gross mass, the load being evenly distributed."

6.6.5.3.4.5.3 Insert a comma after "drop test"

6.6.5.4.1 and 6.6.5.4.3 Delete "s" from "packagings"

6.6.5.3.3.3 Amend "plastic" to "plastics"

## Chapter 6.7

6.7.2.1 Replace (b) (i) below the headings *Maximum allowable working pressure (MAWP)* and *Design pressure* to read:

"(i) the absolute vapour pressure (in bar) of the substance at 65 °C [(at the highest temperature during filling, discharge or transport for elevated temperature substances transported above 65 °C)], minus 1 bar;"

6.7.2.2.10 Insert, after the second sentence, the following text:

"A shell used for the transport of solid substances of Packing Groups II or III only which do not liquefy during transport may be designed for a lower external pressure, subject to competent authority approval. In this case the vacuum-relief device shall be set to relieve at this lower pressure."

6.7.2.2.17 Add the following new paragraph:

"6.7.2.2.17 Thermal insulation directly in contact with the shell intended for substances transported at elevated temperature shall have an ignition temperature at least 50 °C higher than the maximum design temperature of the tank."

6.7.2.5 Add the following new paragraphs:

"6.7.2.5.12 The heating system shall be designed or controlled so that a substance cannot reach a temperature at which the pressure in the tank exceeds its MAWP or causes other hazards (e.g. dangerous thermal decomposition).

6.7.2.5.13 The heating system shall be designed or controlled so that power for internal heating elements shall not be available unless the heating elements are completely submerged. The temperature at the surface of the heating elements for internal heating equipment, or the temperature at the shell for external heating equipment shall, in no case, exceed 80% of the autoignition temperature (in °C) of the substance carried.

6.7.2.5.14 If an electrical heating system is installed inside the tank, it shall be equipped with an earth leakage circuit breaker with a releasing current of less than 100mA.

6.7.2.5.15 Electrical switch cabinets mounted to tanks shall not have a direct connection to the tank interior and shall provide protection of at least the equivalent of type [IP 56] according to IEC 144 or IEC 529."

6.7.2.19.4 Insert after the first sentence the following text :

"For tanks only used for the transport of solid substances other than toxic or corrosive substances, which do not liquefy during transport, the hydraulic pressure test may be replaced by a suitable pressure test at 1.5 times the MAWP, subject to competent authority approval."

## ALPHABETICAL INDEX

Amend in accordance with amendments to Chapter 3.2.

In addition, add the following new entry:

"Hydrazine hydrate, see 8 2030"